## REMARKS

Applicants respectfully acknowledge receipt of the Office Action mailed November 24, 2008.

In the Office Action, the Examiner rejected claims 19 and 22-24 under 35 U.S.C. § 103(a) as being unpatentable over *Lee et al.* (U.S. Patent No. 6,857,388) in view of *Fukuda et al.* (U.S. Patent No. 5,449,411) and *Zhao et al.* (U.S. Patent Pub. No. 2004/0144490); rejected claims 20 and 25-27 under 35 U.S.C. § 103(a) as being unpatentable over *Lee* in view of *Fukuda* and *Zhao*, and further in view of *Takahashi et al.* (U.S. Patent No. 5,520,743), and rejected claims 21 and 28-30 under 35 U.S.C. § 103(a) as being unpatentable over *Lee* in view of *Fukuda*, *Zhao*, and *Takahashi*, and further in view of *Takagi et al.* (U.S. Patent No. 6,402,847).

No claim is amended herein, and claims 19-30 remain pending. Of these claims, claim 19 is independent.

Applicants traverse the rejections above and respectfully request reconsideration for at least the reasons that follow.

### I. 35 U.S.C. § 103(a) REJECTIONS

Claims 19 and 22-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Lee* in view of *Fukuda* and *Zhao*. Applicants respectfully disagree with the Examiner's arguments and conclusions and submit that independent claim 19 is patentably distinguishable over *Lee*, *Fukuda*, and *Zhao* at least for the reasons set forth below.

The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. *See*

M.P.E.P. § 2142, 8th Ed., Rev. 6 (Sept. 2007). Such an analysis should be made explicit and cannot be premised upon mere conclusory statements. *See* id. "A conclusion of obviousness requires that the reference(s) relied upon be enabling in that it put the public in possession of the claimed invention." M.P.E.P. § 2145. Furthermore, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art" at the time the invention was made. M.P.E.P. § 2143.01(III), internal citation omitted. Moreover, "[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious." M.P.E.P. § 2141.02(I), internal citations omitted (emphasis in original).

"[T]he framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). . . . The factual inquiries . . . [include determining the scope and content of the prior art and] . . . [a]scertaining the differences between the claimed invention and the prior art." M.P.E.P. § 2141(II). "Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art." M.P.E.P. § 2141(III).

*Fukuda* appears to disclose a microwave plasma processing apparatus with a vacuum chamber, a substrate holder for mounting a substrate to be processed, a reactive gas feed port, a cleaning gas feed port, a plasma generation device, and a high-frequency electric field application device. (*Fukuda*, Abstract). After the

substrate 1 with the $SiO_2$ film being formed thereon is taken out, the vacuum chamber is cleaned (etched) by a feeding $C_2F_6$ gas through the cleaning gas conduit 8. Microwave is then applied for five minutes to generate plasma. (*Id.* at col. 5, ll. 6-12).

As admitted by the Examiner, however, "Fukuda et al do not teach that during cleaning the inside of said process chamber is evacuated by a second exhaust port positioned lower than said first exhaust port in said process chamber." (*Office Action*, p. 3, ll. 19-20).

Accordingly, in order to cure the deficiencies of *Fukuda*, the Examiner relies on *Lee* and asserts that "Lee et al teach . . . plasma-processing said substrate 64 and introducing after said substrate is plasma-processed a cleaning gas (like SF6) into said process chamber 52 for generating a plasma in the chamber (the inside of said process chamber would be normally evacuated during plasma processing) by a second exhaust unit 58 . . . " (*Office Action*, p. 4, ll. 3-5).

*Lee* appears to disclose a cold wall chemical vapor deposition apparatus including a chamber, a susceptor movable up and down in the chamber, a heat reflector over the susceptor, a heater control unit connected to a wafer, a gas supply unit supplying gases to the chamber, and a power source applying a voltage to the chamber. (*Lee*, Abstract). A cleaning process of the chamber 52 is performed after the thin film deposition process. The cleaning process is performed in a way that an electrical field is formed in the chamber by applying a radio-frequency (RF) voltage to the heat reflector and then cleaning gas, such as sulfur hexafluoride ($SF_6$) plasma gas, is supplied to the chamber 52. (*Id.* at col. 7, ll. 27-38).

The Examiner, however, admits that "Lee et al do not teach the substrate is processed by plasma processing and also do not explicitly teach the second exhaust port is used for evacuating the inside of the process chamber during process chamber cleaning." (*Office Action*, p. 4, ll. 8-10).

The Examiner then alleges that "[i]t would be obvious to use plasma processing for processing the substrate instead of thermal deposition as an alternate known, and exhaust the reaction products through the second exhaust port of Lee et al in view of teaching of Fukuda et al to improve the cleaning of process chamber during cleaning process." (*Office Action*, p. 4, line 22 - p. 5, line 2). The Examiner cites *In re Fout* for the proposition that "[a]n express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious." (*Id.* at p. 5, ll. 4-5). Such ruling, even if supported by *In re Fout*, however, is not applicable to the present rejection and cited references. *Lee* does not teach one equivalent process to the process of "introducing the cleaning gas into [a] process chamber while the inside of said process chamber is evacuated by a second exhaust port positioned lower than [a] first exhaust port in said process chamber." Accordingly, *Lee* also fails to teach or suggest, "introducing . . . a cleaning gas into [a] process chamber while the inside of said process chamber is evacuated by a second exhaust port positioned lower than [a] first exhaust port in said process chamber," as recited in claim 19.

In order to cure the deficiencies of *Lee* and *Fukuda*, the Examiner relies on *Zhao* and asserts that "Zhao et al teach a method of cleaning . . . a CVD chamber 102 wherein during the cleaning operation 212 the process chamber is evacuated to exhaust the deposits that are transformed into volatile compounds by the cleaning

gas . . . " (*Office Action*, p. 5, ll. 13-15). Such teaching, even if present in *Zhao*, which Applicants do not necessarily concede, however, fails to teach or suggest, "introducing . . . a cleaning gas into [a] process chamber while the inside of said process chamber is evacuated by a second exhaust port positioned lower than [a] first exhaust port in said process chamber," as recited in claim 19.

As disclosed in Applicants' specification at page 11, line 24 - page 12, line 15, "the inside of the process chamber 110 is exhausted through the first exhaust port 105 . . . , and the cleaning gas is ejected from the holes 121a of the shower plate 121 . . . [and] [a]t this time, the inside of the process chamber 110 is exhausted through the second exhaust port 106" (emphasis added).

Accordingly, with respect to independent claim 19, *Lee*, *Fukuda*, and *Zhao* fail to teach Applicants' claimed combination, including, *inter alia*:

> introducing . . . a cleaning gas into [a] process chamber while the inside of said process chamber is evacuated by a second exhaust port positioned lower than [a] first exhaust port in said process chamber.

As explained above, the elements of independent claim 19 are neither taught nor suggested by the cited references. Consequently, the Office Action has neither properly determined the scope and content of the prior art nor properly ascertained the differences between the prior art and the claimed invention. Accordingly, no reason has been clearly articulated as to why the claims would have been obvious to one of ordinary skill in view of the prior art. Therefore, a *prima facie* case of obviousness has not been established for independent claim 19, and claims 22-24, which depend from claim 19. Claims 19 and 22-24 are therefore patentable over *Lee*, *Fukuda*, and *Zhao*.

Applicants therefore request that the rejection of claims 19 and 22-24 under 35 U.S.C. § 103(a) be withdrawn.

Claims 20 and 25-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Lee* in view of *Fukuda* and *Zhao*, and further in view of *Takahashi*; and claims 21 and 28-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Lee* in view of *Fukuda*, *Zhao*, and *Takahashi*, and further in view of *Takagi*. The shortcomings of *Lee*, *Fukuda*, and *Zhao* are discussed above.

With respect to *Takahashi*, the Examiner alleges, "Takahashi teaches a substrate processing apparatus with a up/down movable substrate W and a first and second exhaust ports 32, 45 respectively, wherein the first exhaust port 32 is disposed higher than the substrate W (in its lowered position) . . . " (*Office Action*, p. 6, ll. 13-15); and with respect to *Takagi*, the Examiner alleges, "Takagi et al teach a plasma processing method including a processing chamber 1 where the substrate is movable up/down during etching and cleaning operations . . . Takagi et al also teach that during processing the first exhaust port is positioned higher than the surface of the substrate . . . " (*Id.* at p. 7, ll. 17-23). Such teachings, even if present in *Takahashi* and *Takagi*, however, fail to teach or suggest, at least, "introducing . . . a cleaning gas into [a] process chamber while the inside of said process chamber is evacuated by a second exhaust port positioned lower than [a] first exhaust port in said process chamber," as recited in independent claim 19. Thus, claims 20, 21, and 25-30 are allowable at least due to their dependence from independent claim 19.

## II. CONCLUSION

Applicants respectfully submit that independent claim 19 is in condition for allowance. In addition, claims 20-30 are in condition for allowance at least due to their dependence from independent claim 19.

The Office Action contains characterizations of the claims and the related art with which Applicants do not necessarily agree. Unless expressly noted otherwise, Applicants decline to subscribe to any statement or characterization in the Office Action.

In view of the foregoing remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account 06-0916.

Respectfully submitted,

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